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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/771,494 | 02/04/2004 | Chan-Soo Hwang | 678-1272 | 2871 |

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THE FARRELL LAW FIRM, P.C.
333 EARLE OVINGTON BOULEVARD
SUITE 701
UNIONDALE, NY 11553

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| EXAMINER |
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ETTEHADIEH, ASLAN

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| ART UNIT | PAPER NUMBER |
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2611

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| MAIL DATE | DELIVERY MODE |
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09/19/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/771,494

Applicant(s)

HWANG ET AL.

Examiner

Aslan Ettehadieh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 July 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 5-12 and 17-24 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 and 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5, 10, 12, 17, 22 and 24 is/are rejected.
- 7) ☒ Claim(s) 6-9, 11, 18-21 and 23 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 February 2004 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Invention II in the reply filed on 07/05/2007 is acknowledged. The traversal is on the ground(s) that search and examination of the entire application would not place a serious burden on the Examiner and to classify both groups into one subclass. This is not found persuasive because claims 1 – 4 and 13 – 16 are drawn to figure 5 which is a transmitter, classified in class 375, subclass 295; and claims 5 – 12 and 17 – 24 are drawn to figure 6 which is a receiver, classified in class 375, subclass 316. The search and examination of the entire application would place a serious burden on the Examiner. The requirement is still deemed proper and is therefore made FINAL. Office action address elected claims of Group II, claims 5 – 12 and 17 – 24 only.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Information Disclosure Statement

4. The information disclosure statement filed 07/12/2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document;

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each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 5 and 17 recites the limitation "the received signal by the previously received signal". There is insufficient antecedent basis for this limitation in the claim. Does applicant mean a signal received, or refer to the signal received from the delay or the symbol collector, etc. This also causes an insufficient antecedent basis problem for the same limitation in the power estimator limitation. Also due to the insufficient antecedent basis problem the claim is also incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 5 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Badke (US 5953365).

7. Regarding claims 5 and 17, Badke discloses a receiver (and method thereof) for receiving information symbols encoded with a differential space-time block code (STBC) before being transmitted and decoding the received information symbols in a wireless communication system, the receiver comprising: a delay group for delaying a signal received for a previous block duration (figure 3 element 88, col. 1 lines 59 – 61, col. 3 lines 16 – 21, col. 4 lines 4 – 7); a symbol collector for collecting a signal received from a plurality of transmission antennas for a block duration (figure 1 element 30, 56, figure 3 element 118, col. 1 lines 29 – 35, col. 3 lines 22 – 24, col. 4 lines 12 – 21); a multiplier group for outputting a substitution signal by multiplying the received signal by the previously received signal (figure 3 element 102, col. 5 lines 3 – 19); a power estimator for estimating channel power for a channel from the plurality of transmission antennas to the receiver, with the received signal (col. 1 lines 50 – 54, col. 5 lines 32 – 42); a normalizer for outputting normalized channel power by multiplying the estimated channel power by a normalization value that is determined as a size of the previously received symbols (figure 3 element 130, col. 6 lines 17 – 21, col. 6 line 52 – col. 7 line 55); a divider for calculating information symbols by dividing the substitution signal by the normalized channel power (figure 3 element 130, col. 6 line 52 – col. 7 line 55); and a detector for restoring an information sequence with the information symbols (figure 1 element 34, col. 1 lines 43 – 45, col. 9 lines 16 – 62).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 12 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Badke (US 5953365).

9. Regarding claims 12 and 24, Badke discloses the information symbols are real numbers and are grouped by a predetermined number of symbols to carry one of PSK (Phase Shift Keying) and QAM (Quadrature Amplitude Modulation) data (col. 1 lines 13 – 21, col. 6 line 38 – col. 7 line 38). Badke does not specify the type of modulation used, however, it would have been obvious to one skilled in the art at the time of invention was made to use one of PSK (Phase Shift Keying) and QAM (Quadrature Amplitude Modulation) in the system of Badke because PSK has the advantage of being more efficient than frequency shift keying because it minimizes the required bandwidth and the effect of noise and QAM has the benefit of improving the transfer rate and transmission reliability.

10. Claims 10 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Badke (US 5953365) in view of Marchok et al. (US 6771590).

11. Regarding claims 10 and 22, Badke discloses only dividing the correlation and the absolute square function. Badke does not disclose the normalization value is calculated by dividing an autocorrelation value of a previously received signal by the estimated channel power and then taking a square root.

In the same field of endeavor, however, Marchok discloses the normalization value is calculated by dividing an autocorrelation value of a previously received signal

by the estimated channel power and then taking a square root (col. 10 line 63 – col. 11 line 19).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use the normalization value is calculated by dividing an autocorrelation value of a previously received signal by the estimated channel power and then taking a square root as taught by Marchok in the system of Badke to eliminate Gaussian noise (col. 11 line 6 – col. 11 line 19).

Allowable Subject Matter

12. Claims 6 – 9, 11, 18 – 21 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aslan Ettehadieh whose telephone number is (571) 272-8729. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on (571) 272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aslan Ettehadieh
Examiner
Art Unit 2611

AE


DAVID C. PAYNE
SUPERVISORY PATENT EXAMINER